CLAIMS

1. Apparatus to replace atmospheric oxygen with an inert gas such as N_2 from the minimum of one laminar air boundary layer (3) of substrates moving in the direction of advance (2), for instance rapidly running lines of material that include a first chamber (41) which is open only toward the substrate and otherwise is enclosed by the surrounding outside space (40), said first chamber comprising in the vicinity of a front sealing edge a front corona electrode (5) fed with high-voltage DC and perpendicular to said direction of advance and associated with a mate electrode (7) situated on the other side (42) of the substrate (1), also comprising a further corona electrode (6) behind the front corona electrode (5) on the same side as latter and situated at the rear sealing edge which is perpendicular to the direction of advance (2), the electrode (6) being fed a high DC voltage and being associated with a further mate electrode (8) on the other side (42) of the substrate (1), and further comprising a device feeding the inert gas (15),

characterized in that

the device feeding the inert gas (15) is configured directly behind the partial-vacuum zone (12) forming behind the electron/ion flow (9) of the further corona electrode (6).

2. Apparatus as claimed in claim 1, characterized in that the inert-gas feeding device comprises an inert gas dispenser (14) and is designed as an inert gas nozzle (15) configured near the substrate (1) and enters the partial-vacuum zone (12) and points at same.

3. Apparatus as claimed in either of claims 1 and 2, characterized in that the inert-gas dispenser (14) is fitted with a rear baffle (16) running over the full width of the substrate (1) and with two lateral baffles (21) running parallel to the direction of advance (2) and situated near the surfaces of the substrate (1).

4. Apparatus as claimed in one of claims 1 through 3, characterized in that the baffle (16) is flush with the rear termination of the inert-gas dispenser (14).

5. Apparatus as claimed in one of claims 1 through 4, characterized in that the first chamber (41) is constituted by the front corona electrode (5) and by the further corona electrode (6), by a single upper electrode cover (19) covering both said electrodes and by two lateral electrode covers (20) laterally covering said two corona electrodes.

6. Apparatus as claimed in one of claims 1 through 5, characterized in that the front and/or the further mate electrode (7, 8) is grounded and designed to be a guide roller (7).

7. Apparatus as claimed in one of claims 1 through 5, characterized in that the front and/or the further mate electrode (7, 8) is grounded and designed as a quiescent electrode (8).

8. Apparatus as claimed in one of claims 1 through 7, characterized in that the front and/or the further corona electrode (5, 6) are equally spaced apart by a grid pitch (26) and comprise single tip electrodes configured in one plane that point at a particular surface of the substrate (1).

9. Apparatus as claimed in claim 8, characterized in that the single tip electrodes of the front corona electrode (5) are offset by half the grid pitch (27) relative to the grid pitch (26) of the further corona electrode (6).

10. Apparatus as claimed in one of claims 1 through 9, characterized in that a rear corona electrode (22) together with a rear mate electrode (8) is configured between the inert gas nozzle (15) and the further corona electrode (6) and subtend a further chamber (43).

11. Apparatus as claimed in claim 10, characterized in that the further chamber (43) is constituted in the manner of the first chamber (41) by a rear corona electrode (22) of the

further corona electrode (6), of a single upper electrode cover (19) covering said two corona electrodes and of two lateral electrode covers (20) laterally covering these two corona electrodes.

12. Apparatus as claimed in one of claims 1 through 11, characterized in that a UV radiator (34) fitted with a quartz pane (35) which seals it is mounted directly behind the inert gas nozzle (15) , said quartz pane running parallel to the substrate (1).

13. Apparatus as claimed in one of claims 1 through 12, characterized in that a UV radiator (34) jointly with a sealing corona electrode (31) beside a sealing mate electrode (7) is mounted behind the inert gas nozzle (15) on the other side of the substrate (1).

14. Apparatus as claimed in claim 13, characterized in that the sealing mate electrode (7) is a grounded guide roller.

15. Apparatus as claimed in either of claims 13 and 14, characterized in that the lateral electrode covers (20) are designed to be a lateral cover (36) laterally subtended along the substrate (1) and as far as said substrate's other side (42), said cover on said other side (42) being sealed off by means of a lower chamber cover (37).

16. Apparatus as claimed in one of claims 13 through 15, characterized in that the sealing corona electrode (31) together with the lateral covers (36) of the lower camera cover (37) and the mate electrodes (7) acting as guide rollers subtend a chamber geometry

17. Application of the apparatus claimed in one of claims 1 through 16 to gravure printing, flexographic printing, sheet offset printing or roller offset printing and in coating machinery, for instance in the paper and textile industries.